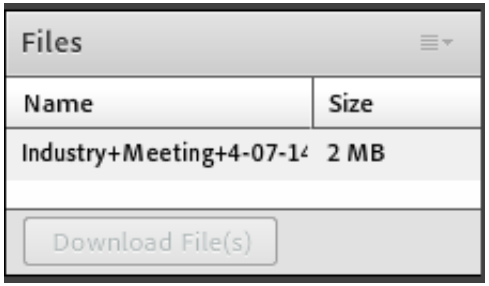
# IAE Technical Architecture

## Industry Meeting
## April 7, 2014

# Welcome!

- We look forward to a dialog today. You will have the opportunity to post questions throughout the presentation. We will post a summary of the questions and answers after this event.




- You can download this deck by selecting it under “Files” and clicking “Download File(s)” any time during this presentation

- All the following diagrams will be available full size in the IAE Industry Community at Interact.gsa.gov

- We will also be posting narrative pieces and other document like the draft SOO in the near future to the Interact site

- You can always contact us at IAEoutreach@gsa.gov

# IAE Today

## How IAE works

- IAE is governed by the Acquisition Committee for E-Government (ACE) within the CAO Council
- IAE is co-led by FAS and OCIO within GSA

## Scope of IAE environment

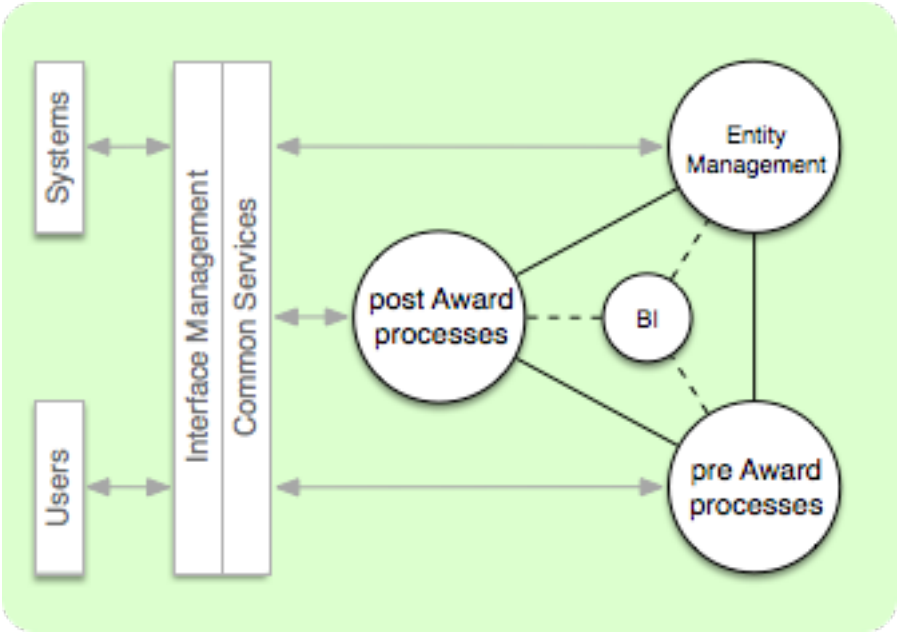
- More than 1 million active registered users
- 650,000 registered businesses
- 800,000 monthly searches on SAM
- 2M+ database transaction daily
- Nearly every government transaction above the simple acquisition threshold (plus every grant and loan)

# IAE Today & Tomorrow

## Current IAE Environment

1. SAM today includes
   - CCR
   - ORCA
   - EPLS
   - FedReg
2. Past Performance Systems
   - PPIRS
   - CPARS
   - FAPIIS
3. Other Systems
   - eSRS
   - FSRS
   - FedBizOpps
   - FPDS-NG
   - CFDA
   - WDOL

## Future IAE Environment



# About the Presentation

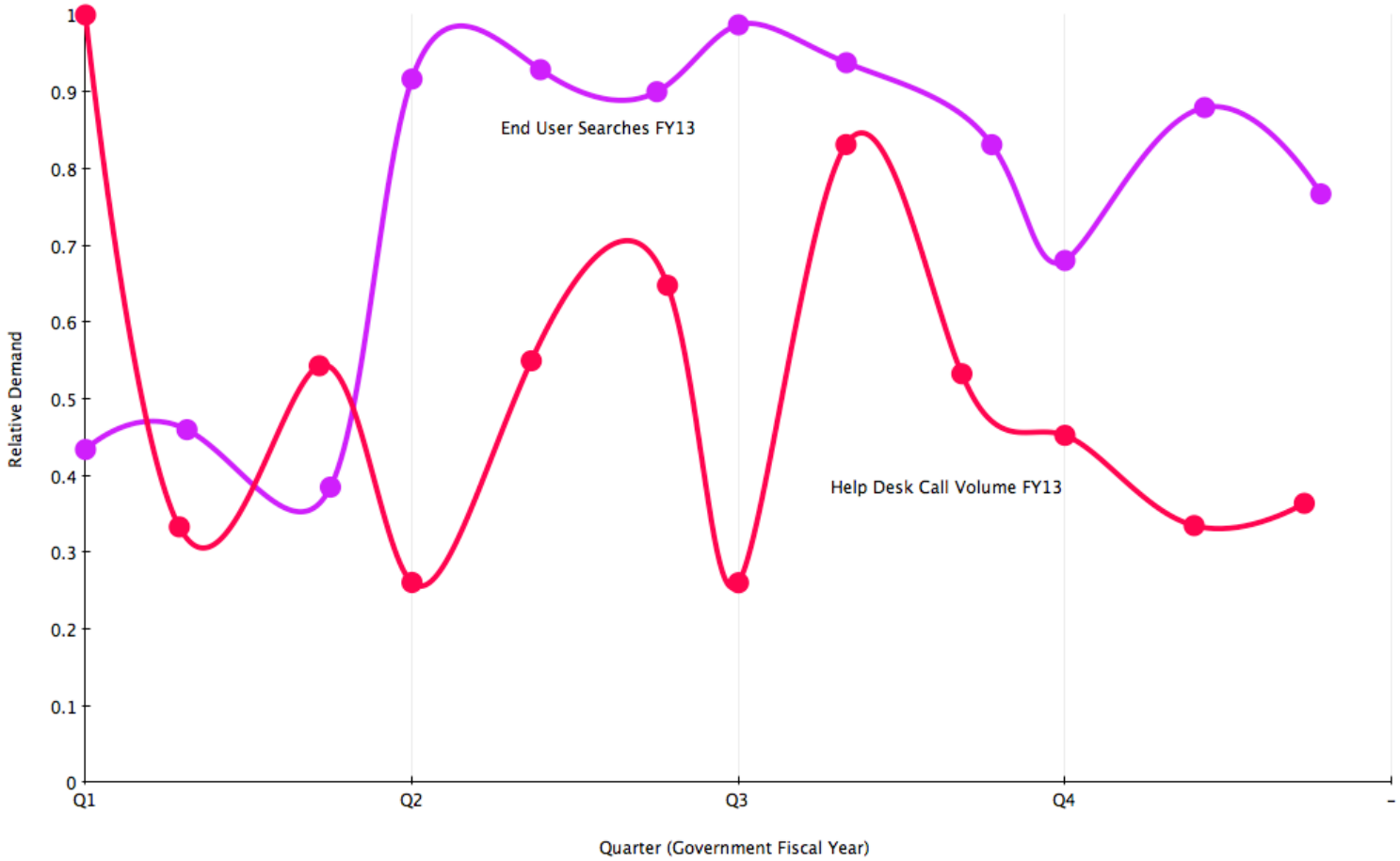
- Introduction to the IAE Environment
- Introduction to the IAE Architecture
- Introduction to the Operating Environment
- Introduction to the Product

# Introduction to the IAE Environment

# IAE Demand

## When do people use IAE during the year?

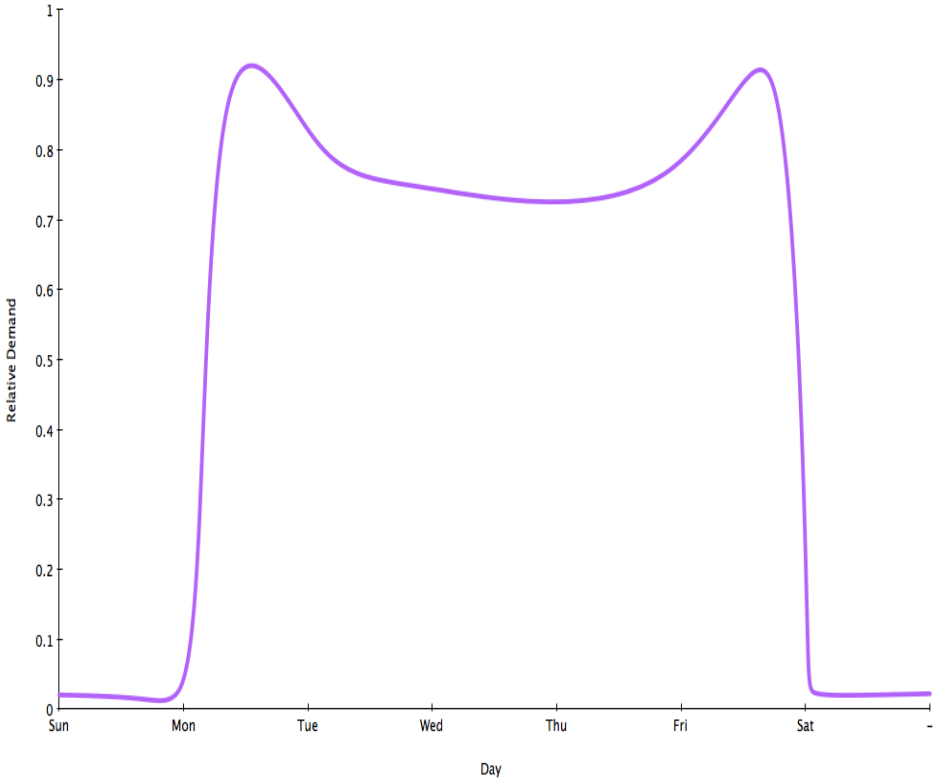
**(Monthly numbers normalized to the largest value)**



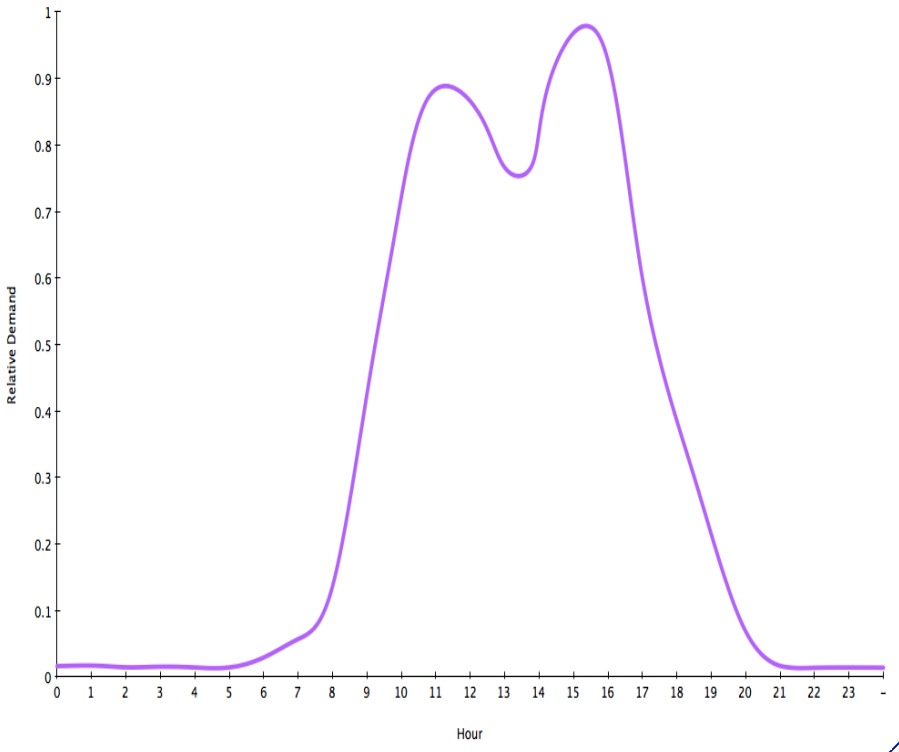

## Government business cycle drives usage

# Demand for IAE Services

## Work Week Demand Curve




## 24 Hour Demand Curve



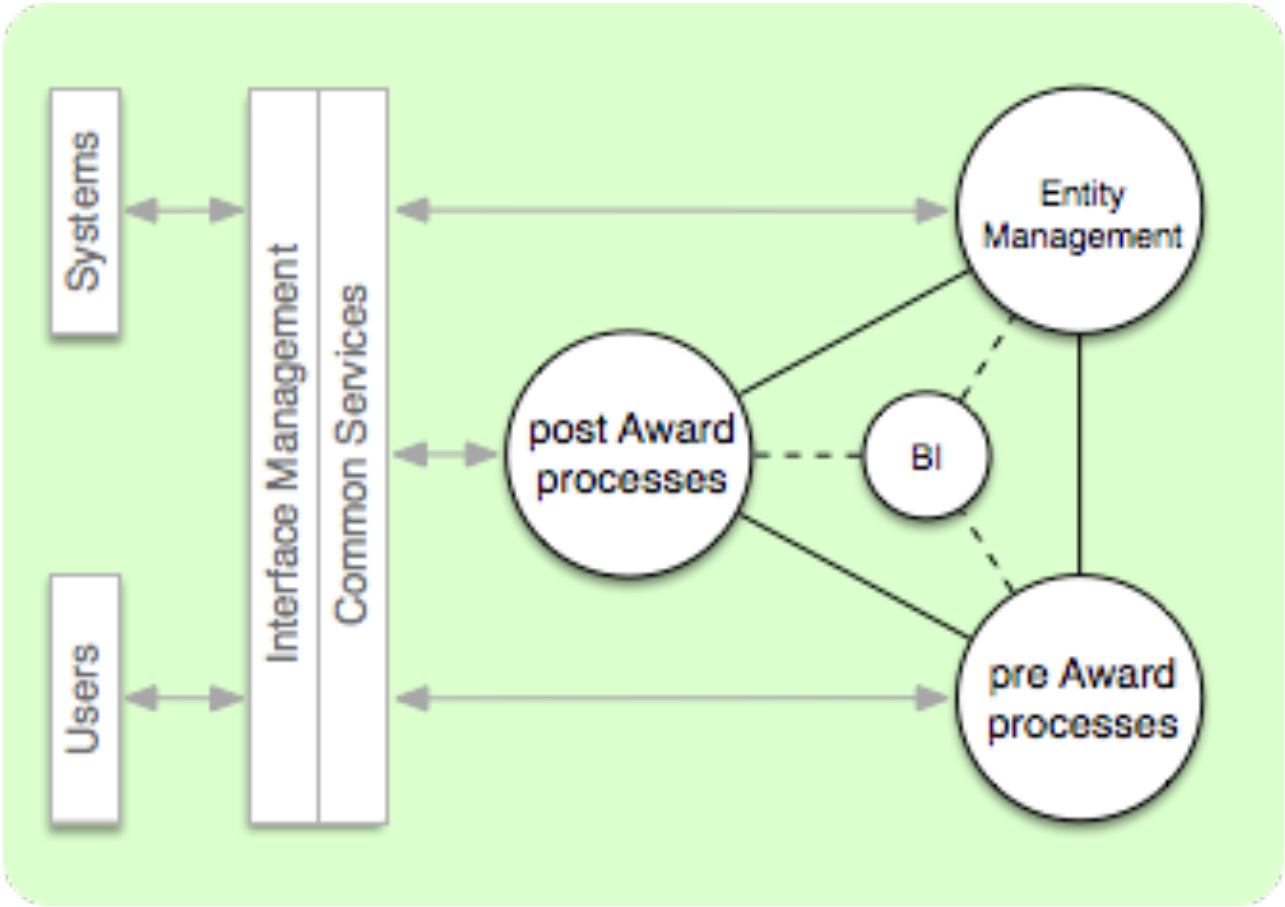
# Introduction to the IAE Architecture

# IAE Architectural Principles

- Be open
- Treat data as an asset
- Use continuous improvement to drive innovation
- Provide an effective user experience for all stakeholders
- Business transactions must be time- and cost-measurable
- Treat security as foundational
- Build value over maintaining status quo

# 3 Cores with APIs

- User centric design
- Agile development
- Data transparency
- Open source, open APIs
- Strong testing
- Strict security protocols
- Continuous integration
- Government owns integration with technical governance support



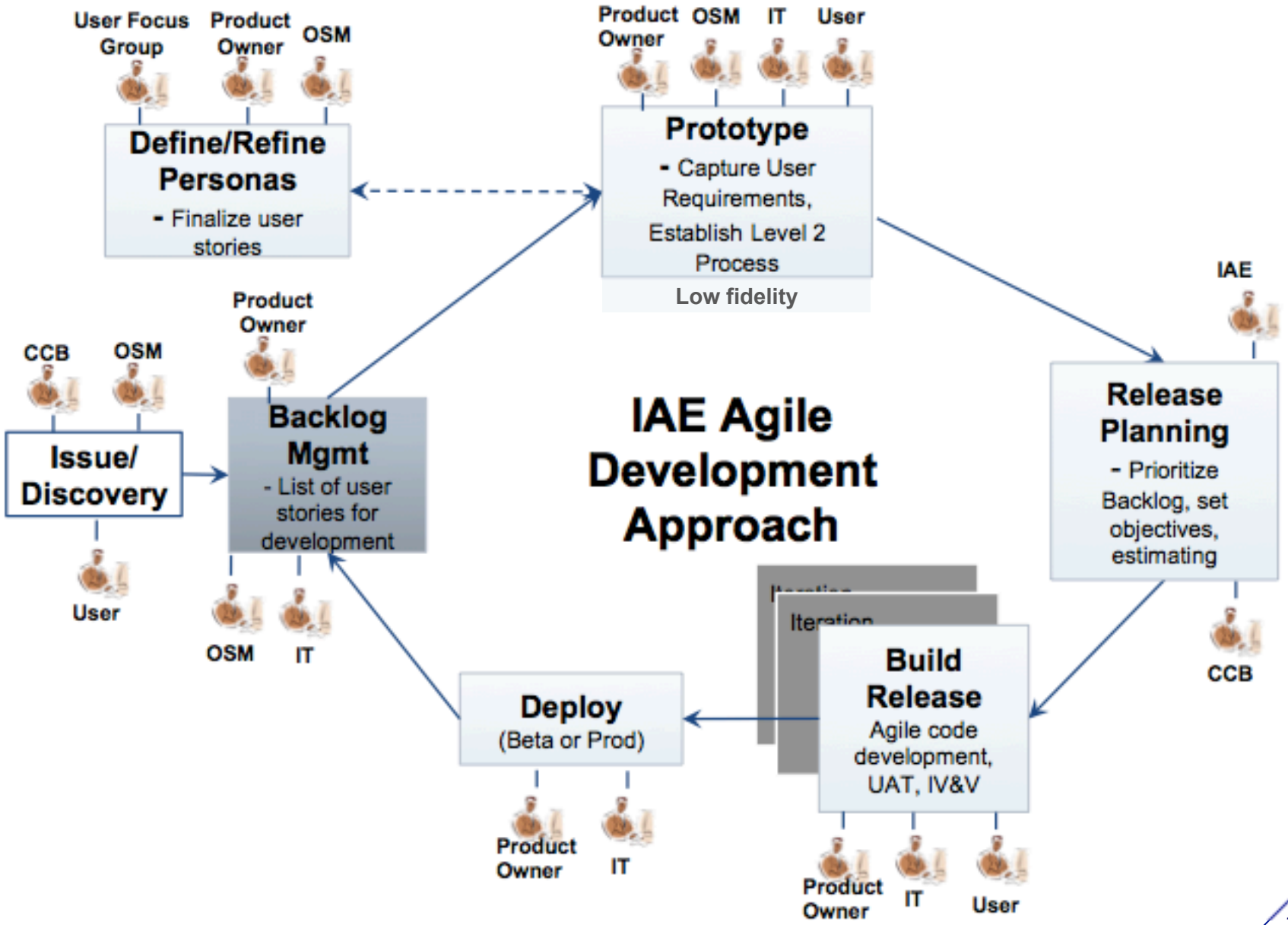
# Introduction to the Operating Environment

# Agile + Continuous Integration

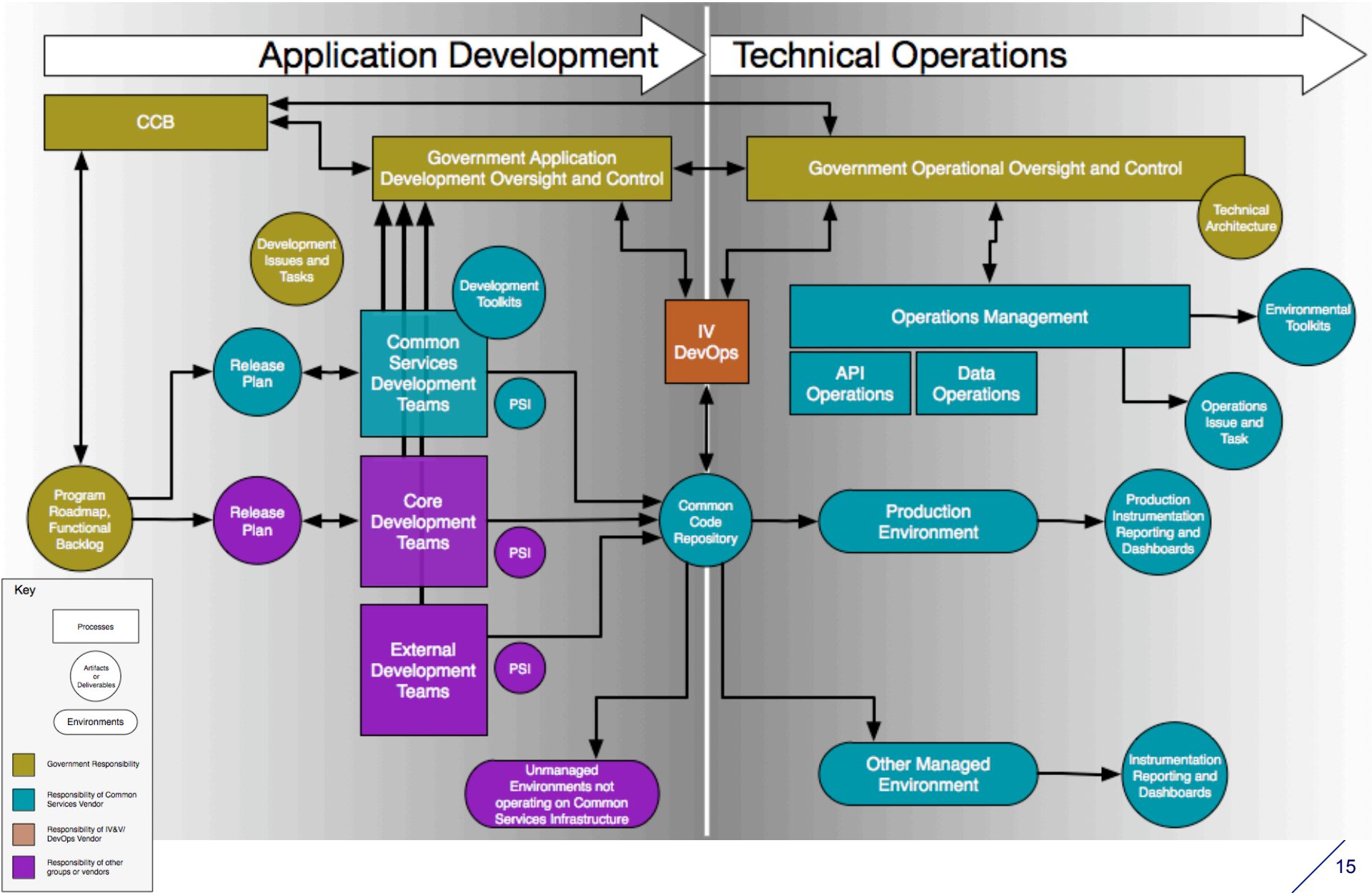
- We will use customized SAFe
- Open, central Code Repository
- DevOps team supporting CI environment
- Automated testing throughout
- Infrastructure as code

# Agile at Scale

Continuous Process



# Organization and Responsibilities



# Upcoming Acquisitions

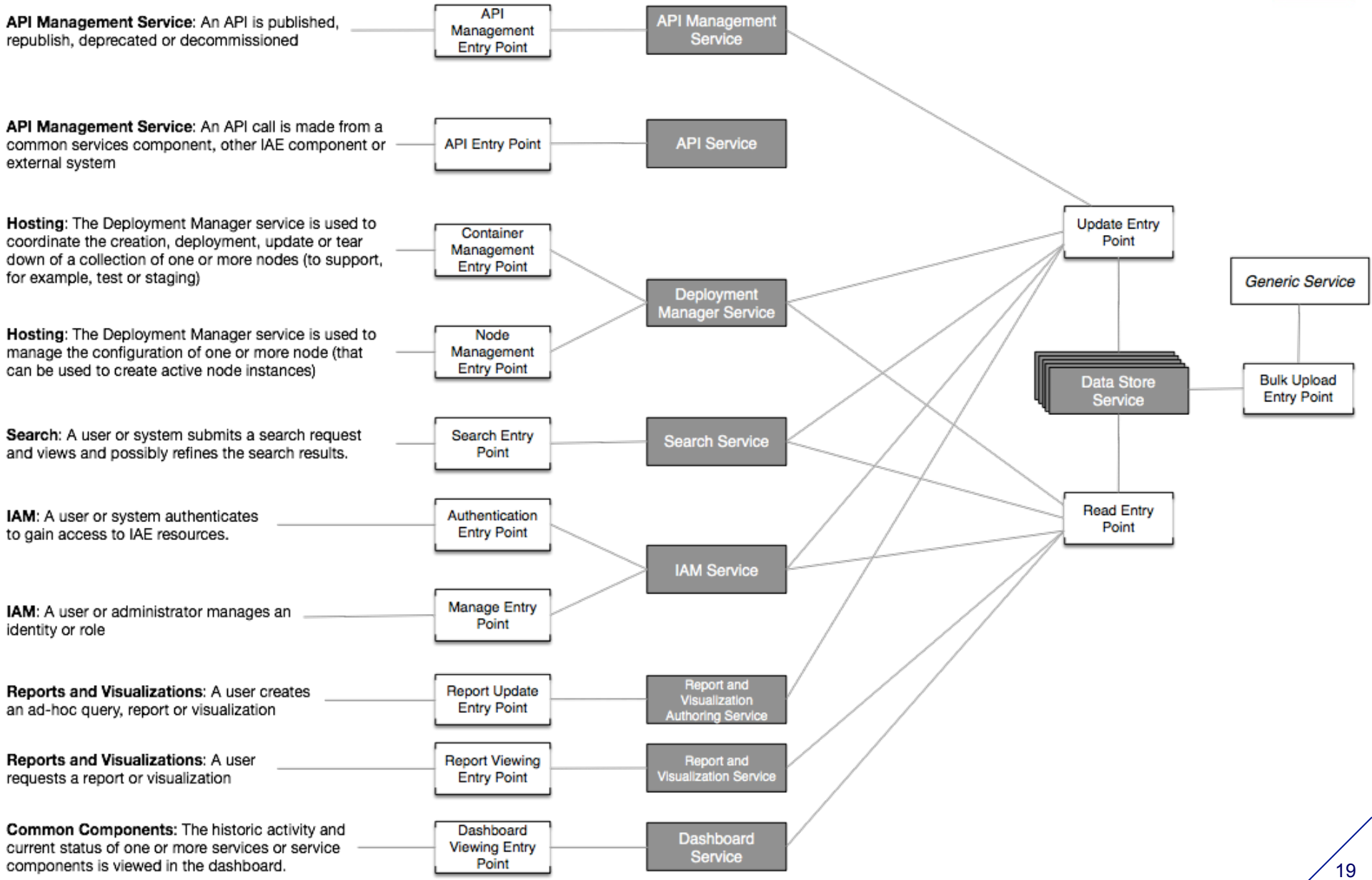
- **Common Services**
  - The common services contractor will build and maintain an architecture that implements IAE's product and demand models that allow other vendors to build business functionality
  - Business functionality that is common across all IAE such as management of the Federal Hierarchy
- **Technical Governance**
  - Supports the government's role as integrator with architecture governance, data governance, UI/UX standards, and other PM support
- **DevOps/IV&V**
  - Uses Common Services DevOps environment to ensure quality of the developed code.

# Introduction to the Product

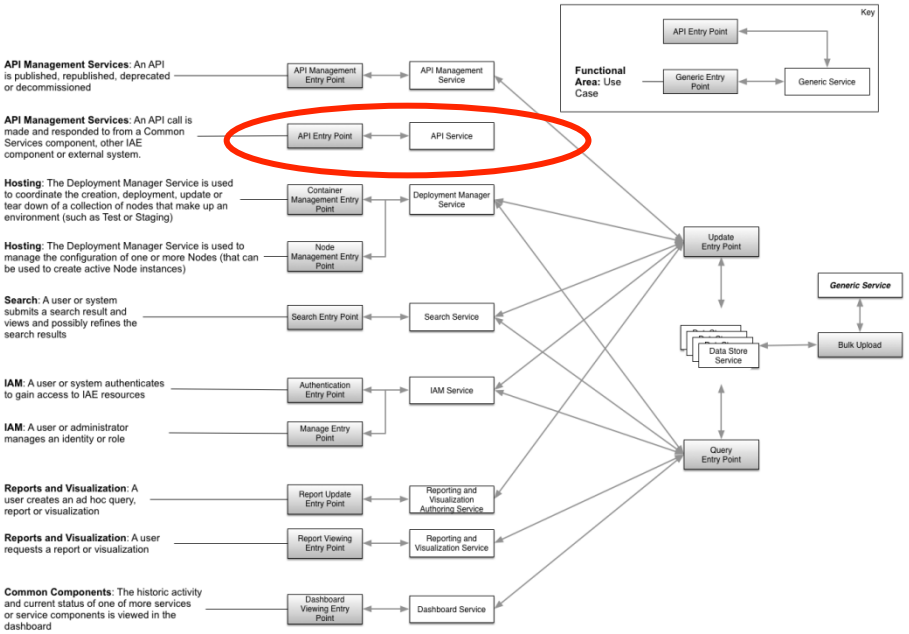
# Everything is a Service

- Database
- Data stores
- Search
- Dashboards
- Hosting
- Reports
- Visualizations
- IAM
- APIs

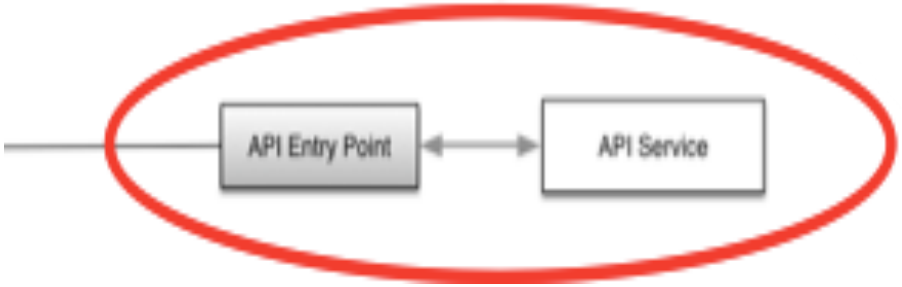
# The Product


**API Management Service**: An API is published, republish, deprecated or decommissioned
API Management Entry Point
API Management Service
**API Management Service**: An API call is made from a common services component, other IAE component or external system
API Entry Point
API Service
**Hosting**: The Deployment Manager service is used to coordinate the creation, deployment, update or tear down of a collection of one or more nodes (to support, for example, test or staging)
Container Management Entry Point
**Hosting**: The Deployment Manager service is used to manage the configuration of one or more node (that can be used to create active node instances)
Node Management Entry Point
Deployment Manager Service
**Search**: A user or system submits a search request and views and possibly refines the search results.
Search Entry Point
Search Service
**IAM**: A user or system authenticates to gain access to IAE resources.
Authentication Entry Point
**IAM**: A user or administrator manages an identity or role
Manage Entry Point
IAM Service
**Reports and Visualizations**: A user creates an ad-hoc query, report or visualization
Report Update Entry Point
Report and Visualization Authoring Service
**Reports and Visualizations**: A user requests a report or visualization
Report Viewing Entry Point
Report and Visualization Service
**Common Components**: The historic activity and current status of one or more services or service components is viewed in the dashboard.
Dashboard Viewing Entry Point
Dashboard Service
Update Entry Point
Read Entry Point
Data Store Service
*Generic Service*
Bulk Upload Entry Point

# The Product




**API Management Services:** An API call is made and responded to from a Common Services component, other IAE component or external system.

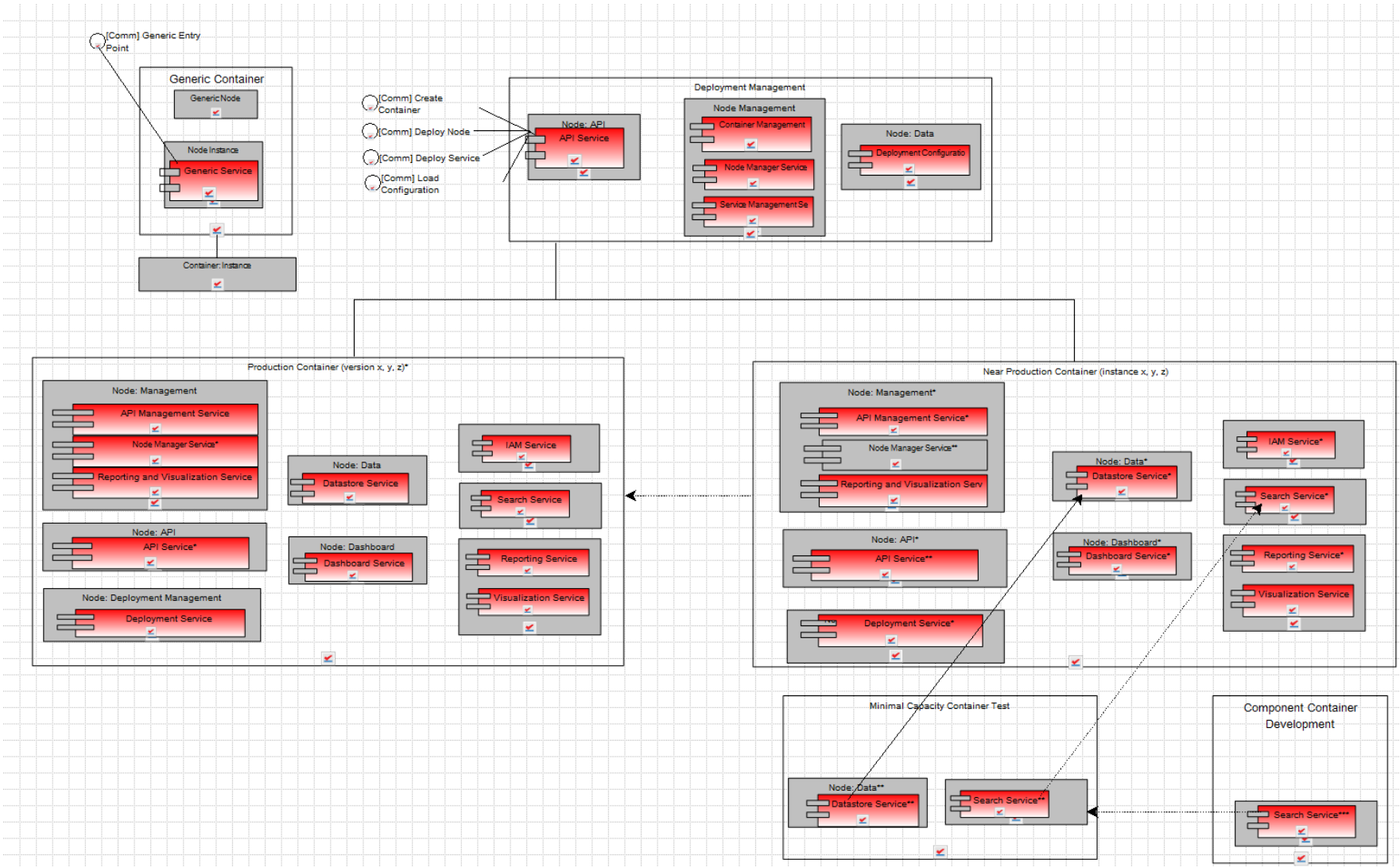



**~65 Business Processes, like: Create Entity, Post Opportunity, View Exclusion**

**These will be implemented in the Cores but will be enabled by Common Services**

# Containers and Nodes

Infrastructure as Code

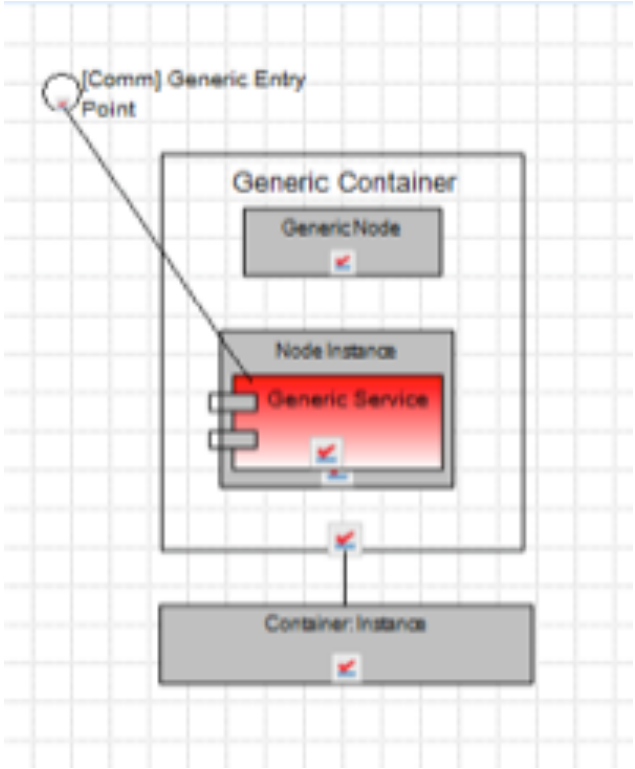


# Container Attributes

| | Production | Production-Like | Minimal Capacity | Component |
|---|---|---|---|---|
| Description | A container that is capable of supporting the full availability, use and data for IAE in a production environment | An container that is capable of supporting the full availability, use and data for a production environment without support for long term sustainability | A container that supports the full range of IAE capabilities at a minimal level | A minimal environment that provides the basic infrastructure, where individual technical and functional capabilities may be deployed |
| Usage Scenario | Production | Load Testing, UAT, Penetration Testing | Demonstrations, functional testing, integration testing, localized development team usage | Development |
| Service Demand | Full production capacity | Peak load and above for load testing, minimal usage for other activities | Individual development team members, IV&V and customer usage, CI testing. CI testing may generate considerable load depending on the level of concurrency achieved during testing. | Developer use, internal development team use |
| Availability | 99.9% | 99.9% | No set objective | No set objective |
| Number | 1 | One, perhaps two depending on work activity | 3-4 | Multiple, perhaps as many as one per developer |

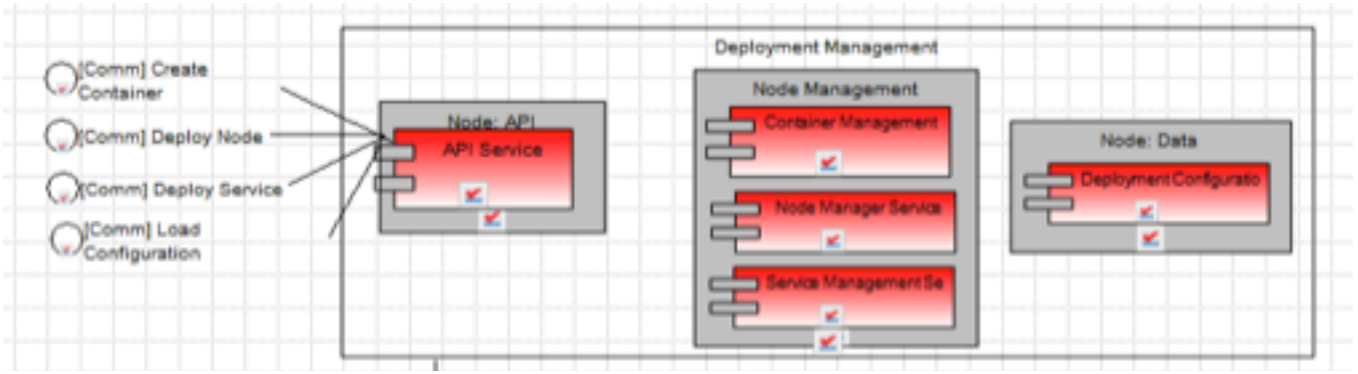
# Containerization

- Generic container
- Generic entry point
- Generic instance

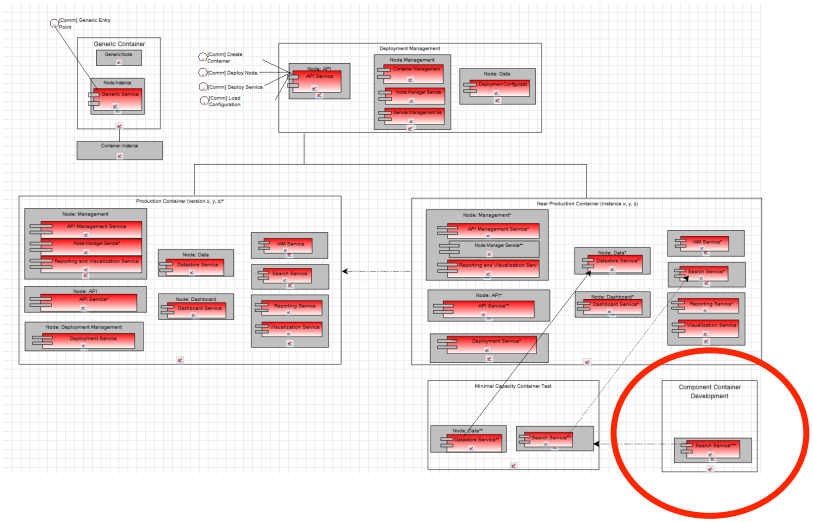


# Containerization

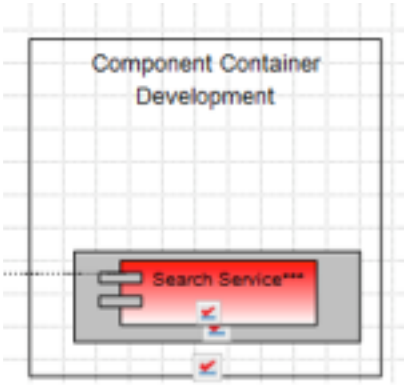
## Deployment Management



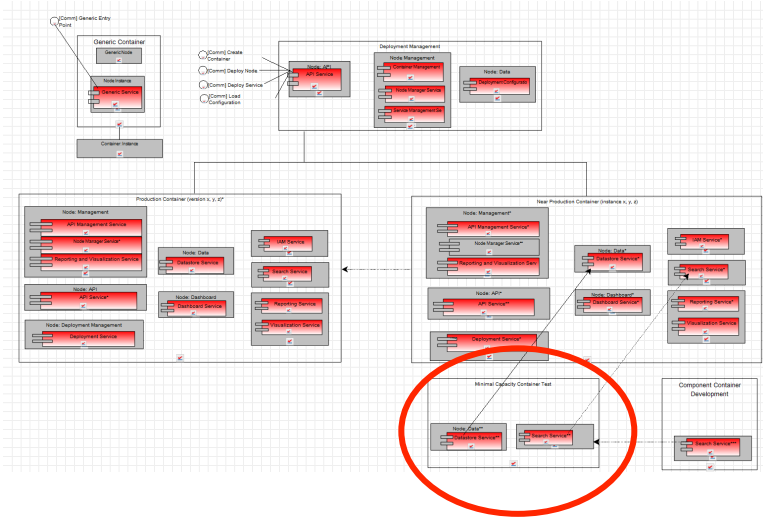
# Containerization



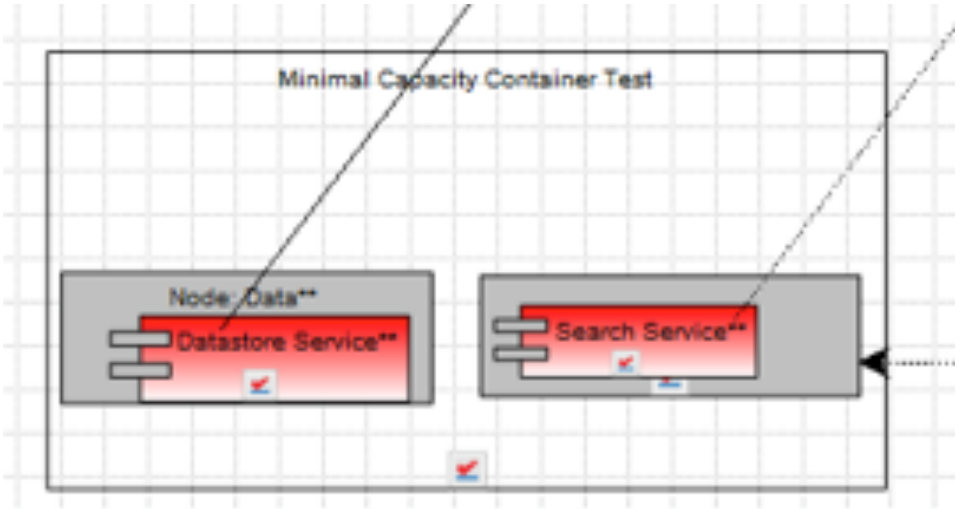
## Component Container: Development



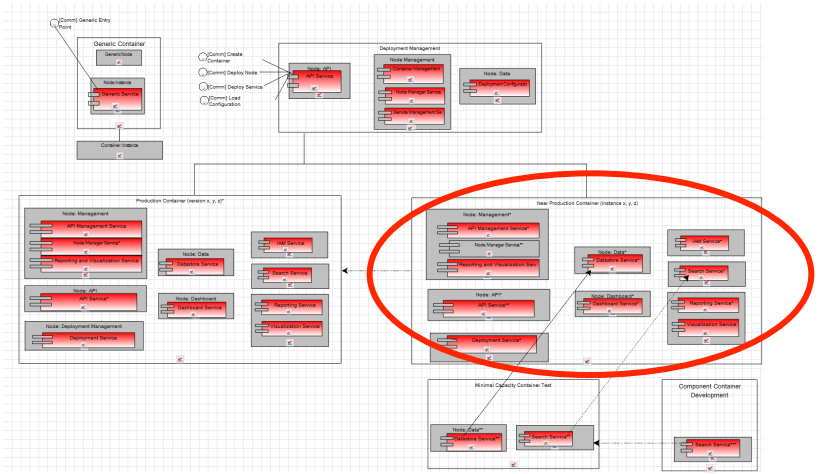
# Containerization



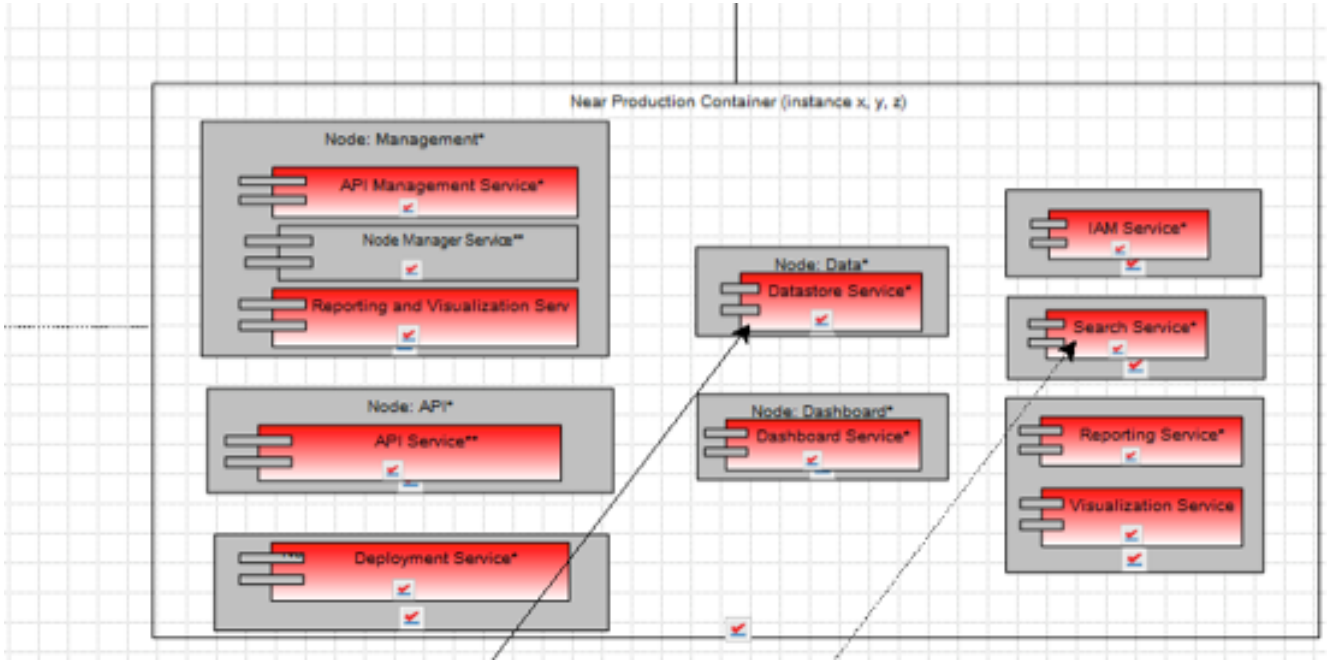
## Minimal Capacity Container: Test



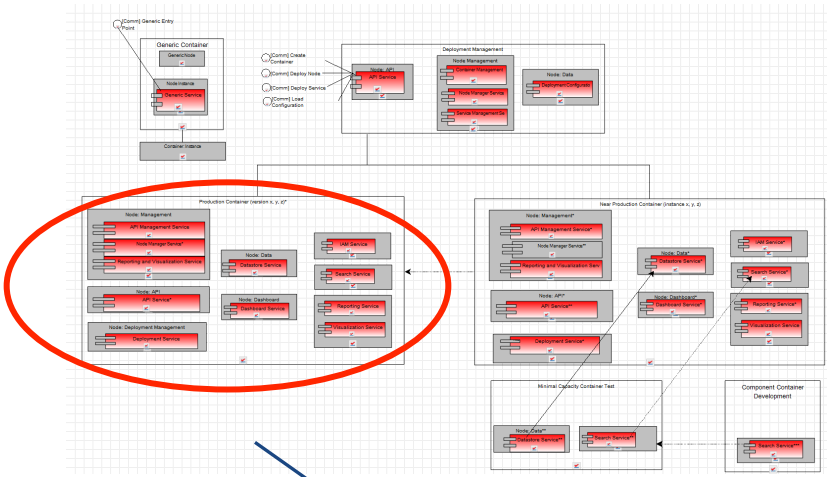
# Containerization



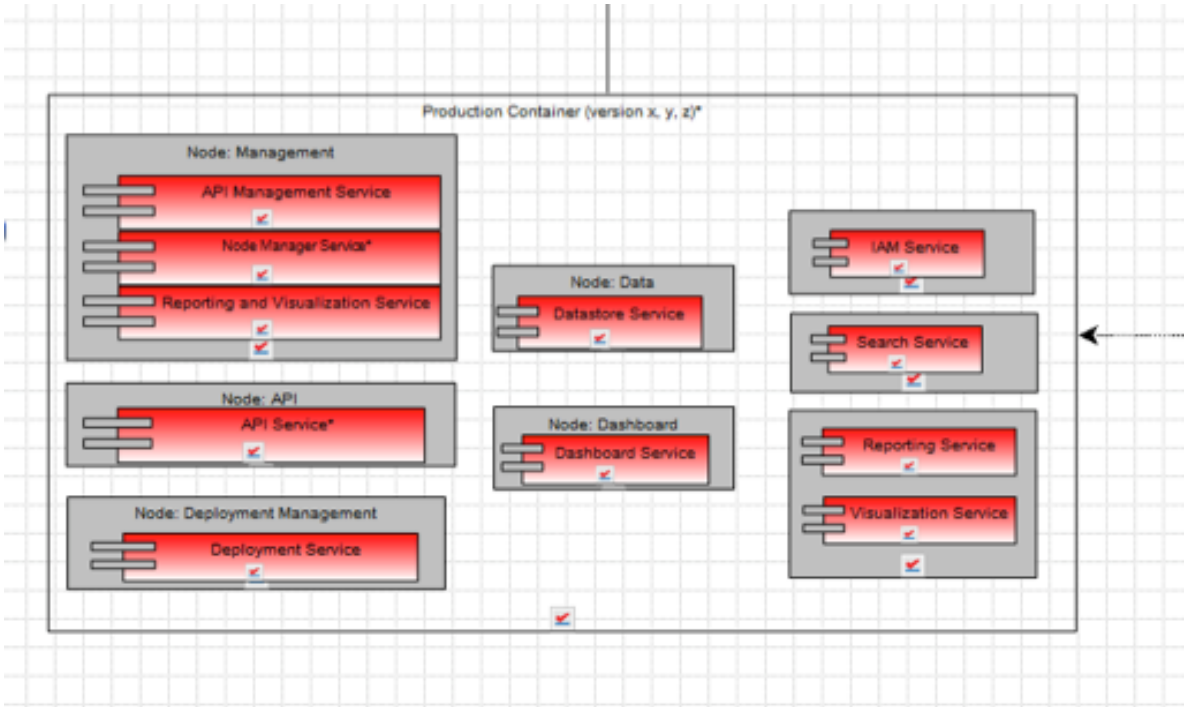
Near Production Container



# Containerization



## Production Container

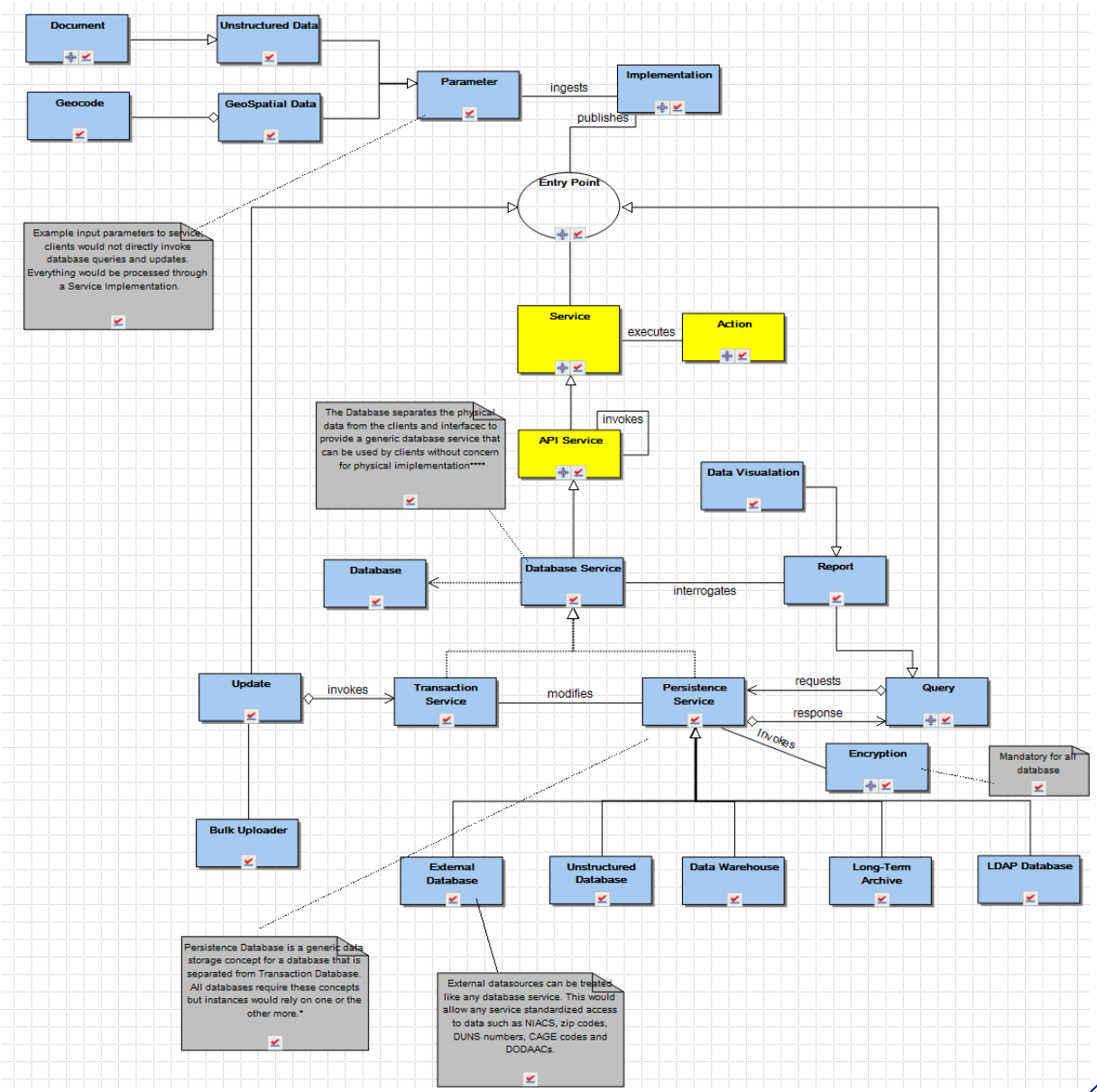


# Example: Data Store

## Entry Points:

- Update
- Read
- Bulk upload

Data store presents services



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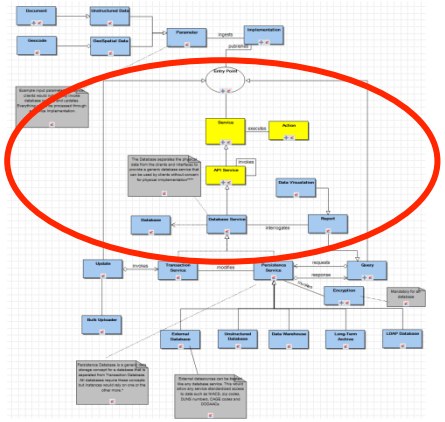

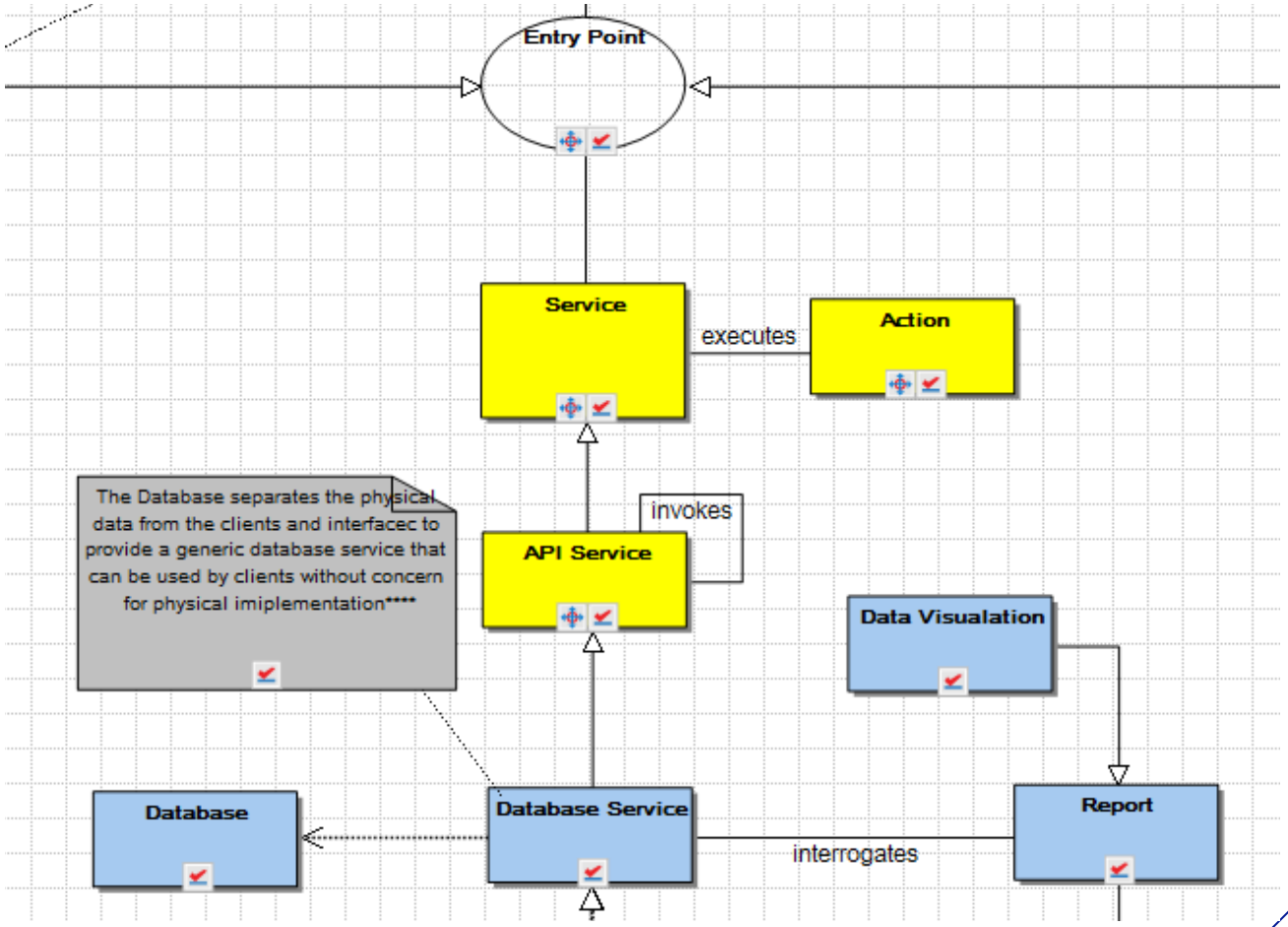

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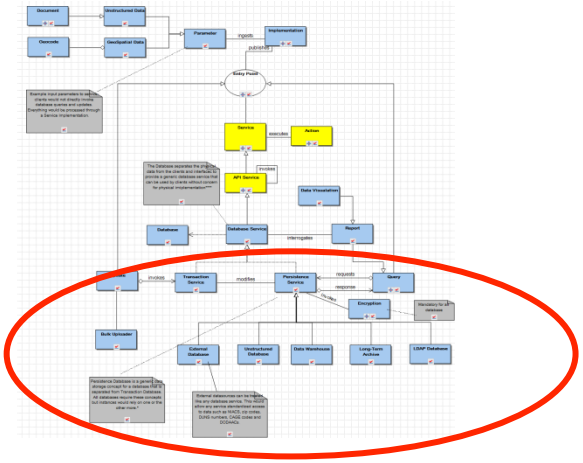

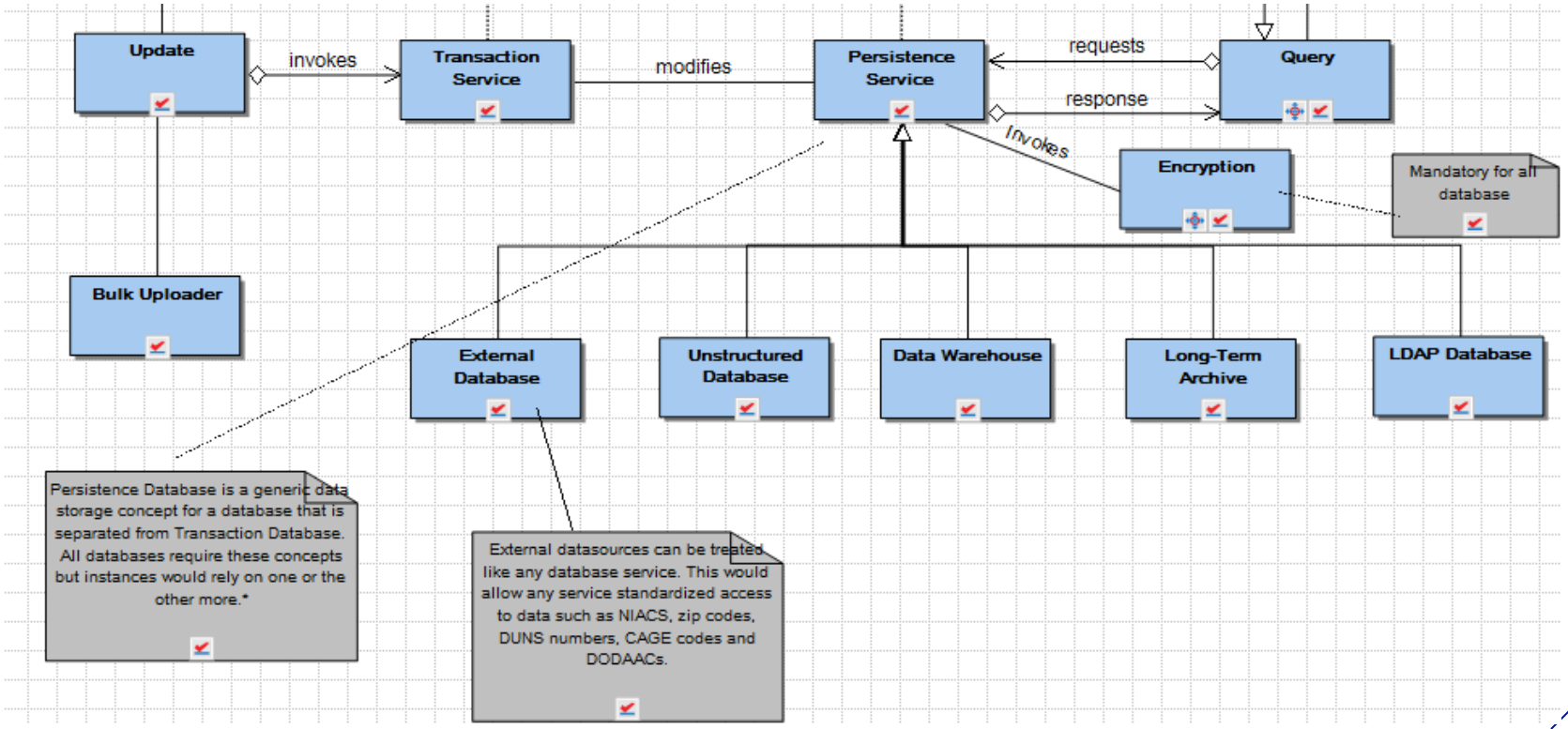

# Closing

- We are driven and guided by our architectural principles
- Our common services platform will support a containerized, flexible environment that supports Davos and CI
- The IAE Program will be organized using an Agile framework
- The development activities will be Agile
- IAE's technical governance contractor will be supporting the government's role as integrator

# Next Industry Day

- Topic: Transparency in IAE
- Date: April 29, 2014 at 1:00 p.m. EST

# How You Can Contribute

- Review the conceptual model and supporting documentation on interact.gsa.gov
- Comments and questions are welcome through the Interact website
- You can contact us anytime at IAEoutreach@gsa.gov